

## **Guideline for Preparation of Traffic Control and Pavement Marking Plans for Design Build Projects**

### **I. Introduction**

Use the following Guidelines in conjunction with the Traffic Control Scope of work provided in the Request for Proposal, Design Build Submittal Guidelines, latest work zone warning details and revised roadway standards to develop the Traffic Control plan and Pavement Marking plan.

### **II. Traffic Control Plan and Final Pavement Marking Plan Development procedure:**

Use the procedure below to develop Traffic Control and Final Pavement Marking plan unless other agreements were made with the Design Build Section.

#### **1. General requirements for developing Traffic Control and Pavement Marking plans**

The Traffic Control Plan must identify all maintenance of traffic needs, including but not limited to, lane closures, road closures, traffic control devices, temporary lane markings, construction signing, etc. The plan will identify lane widths, transition taper widths and any geometry necessary to define placement of devices and temporary roadway alignments, including crossovers. The Plan shall show the pavement design to be proposed for temporary road pavements and pavement markings/markers for temporary patterns on all roads and shoulders.

Ensure the development of the Traffic Control Plan is in compliance with the NCDOT 2002 *Roadway Standard Drawings*, NCDOT 2002 *Standard Specifications for Roads and Structures*, and the 2003 *Manual on Uniform Traffic Control Devices (M.U.T.C.D.)*.

NCDOT's 2002 *Roadway Standard Drawings* – Sections 1100 and 1200 contain traffic control and pavement marking standard details. These will need to be incorporated into the plans for most work activities. The Traffic Control and Final Pavement Marking plan will require details where traffic control activities, device placement and/or pavement marking layout cannot be entirely covered by these standard drawings.

The Work Zone Traffic Control web site, shown below will contain the latest microstation cell libraries, revised roadway standard drawings, latest work zone warning sign details, and special provisions.

<http://www.doh.dot.state.nc.us/construction/wztc>

#### **2. Plan Layout:**

##### **a. TCP and Final Pavement Marking Plan Scale and Format**

Submit Traffic Control Plan Sheets to comply with the following:

- Overview sheets should be developed with a maximum scale of 1" = 500' (Metric 1:5000)\*
- Detail sheets should be developed with a maximum scale of 1"=50' (Metric 1: 500) \*
- Half-size sheets should be 11" x 17".
- Number all sheets.
- The Traffic Control plan should build from the first phase submittal, each subsequent phase submittal should be easily added to the previous phase submittals with minimal revisions to the existing plan.

\*Scales are for full-size prints.

b. TCP and Final Pavement Marking Plan Layout

The plan layout should contain:

- **Title sheet**, with Index of sheets, list of 2002 *Roadway Standard Drawings* and Legend. See the WorkZone Traffic Control website for microstation cell library that contains standard cell for the Titlesheet. Title Sheet shall also contain the following for NCDOT contacts:

NCDOT CONTACT INFORMATION

Phone Number (919) 250-4128 Fax number (919) 250-4119

Rodger Rochelle, PE, State Alternate Delivery Systems Engineer

Teresa Bruton, PE, Design Build Project Engineer

Mitch Hendee, PE, Design Build Engineer

- **General Note sheet(s)**, shall contain the appropriate notes from the list provided in the Traffic Control Scope in the RFP.
- **Phasing sheet(s)**, which explain how the project will be constructed while maintaining traffic and following the three rules of phasing below:
  - (1.) What Traffic Control is being used to handle traffic during this Construction? (for example: Is construction away from traffic or are lane closures and/or flaggers used during construction.)
  - (2.) What construction is taken place
  - (3.) Where is traffic at the end of the workday?
- **Project overview sheet(s)**, can be used per phase to show where construction is occurring and how traffic will be maintained. For complicated or long projects, overviews can be used to show detail sheet locations.
- **Details sheet(s) per phase**, details will give more information than the project overview, showing device locations, pavement marking layout and other necessary information. Temporary Hydro and roadway designs can also be shown on these details.
- **Work Zone Warning Sign Detail Sheet(s)**, provide the appropriate Work Zone Warning Sign details from the Work Zone Traffic Control website. These details are not needed if designer chooses to place the signs on a project overview or in phase details. The details require the designer to modify and customize them to match project conditions and shall be sealed by the Designer.

- **Temporary Offsite Detour sheet(s)**, if required, the detour details shall identify the route, all signing and devices required. Sign designs for special signs will need to be included in the Traffic Control plan.
- **Revised Standard Drawing(s)**, see the Work Zone Traffic Control website for the latest revised standard drawings and include them in the plan if needed.
- **Final Pavement Marking plan**, shall include details for any area that roadway standard drawings do not apply and a legend for the type and material.

Other Plan requirements:

- All details and overviews shall show north arrows, traffic flow arrows, road names and any other features important to traffic control phasing.
- All Temporary hydraulics, shoring, roadway and sign designs will need to be submitted with the appropriate traffic control phase submittal, but also submitted in a separate package for review by the appropriate design unit.
- Pavement Marking Schedules are not required, but a legend matching the symbology that the Work Zone Traffic Control Unit currently uses will need to be included in the Traffic Control and Final Pavement Marking Plan matching the pavement markings and markers material types listed in the Traffic Control Scope of Work in the RFP.

### 3. First Submittal, Staging Concept and preliminary Final Pavement Marking plan

The first submittal shall consist of an unsealed Staging Concept and an unsealed Preliminary Pavement Marking plan.

#### a. Staging Concept

This submittal typically consists of a title sheet, general notes sheet(s), overview sheet(s), brief staging, work zone warning sign details, proposed detour(s) if applicable, typical section(s) and detail(s) for more complex construction issues.

Staging can be placed on overview sheet(s) or on separate sheet(s). Follow the three rules of phasing listed above but staging can be less descriptive than the phasing required for the phase submittals. For example, the following could be written:

*Away from traffic, construct the following: -L-, -Y1-, -Y2- and -Y3-. Traffic remains on existing alignment during this construction. (See TCP-X)*

*OR*

*Using flaggers and lane closures, construct the tie-in of proposed -Y2- while maintaining -Y2- on the existing alignment. Shift -Y2- to proposed traffic pattern by the end of the work day. (See TCP-X)*

Below is a list of items the Staging Concept shall identify if applicable. Provide information on why and where it could be needed:

- Identify the proposed temporary traffic barrier system.
- Temporary pavement
- Temporary shoring
- Temporary Structures
- Structure staging
- Temporary Drainage
- Temporary Signals
- Temporary Signing
- Temporary on-site or off-site detours
- All roadway construction

b. Preliminary Pavement Marking Plan

Submit a Preliminary Pavement Marking Plan to show the pavement marking for the final alignment. Show how markings will connect to existing and include any markings outside of construction limits affected by temporary traffic patterns. Number all sheets that are included in the Preliminary Pavement Marking Plan and include a general statement pertaining to the type of material used for pavement marking on the final wearing surfaces throughout the project.

4. Phase Submittal(s) and Final Pavement Marking Plan

Phase submittals should include more detailed information than what is required for the staging concept which shall include detailed phasing and detail sheets that show what construction will take place and how traffic will be maintained.

a. Information required in details

- (1) Typical and/or Cut-Section views can be useful to illustrate where construction is occurring in relation to where traffic and devices are located. Match the shading of construction areas with plan view. Typical and /or Cut-sections are required when an approved temporary barrier system is used.
- (2) Shade **only** proposed work that is started, under construction or completed during each particular phase of construction. Completed work is shown with solid lines and is not shaded.
- (3) Do not show traffic being maintained in shaded areas.
- (4) Show separate Detail Sheets for separate phases of work. Label all roads and other features. Dimension lane and shoulder widths. Show traffic flow arrows and north arrows.
- (5) Details for any given phase of work should show only the work included in that phase.
  - (6) Show all necessary Traffic Control devices, required Signing and any temporary Pavement Markings on Detail Sheets and in Cut-Section Views (use required scale).
  - (7) Show proposed center line ticks and stations.
  - (8) Show all temporary Pavement Markings for all signalized intersections on Detail Sheets (use required scale).

b. Phasing

- (1) The phasing will need to be more detailed than staging and still following the three rules of phasing. Below are some examples:

*Step 1: Using Roadway Standard Drawing 1101.02, sheet 1 of 7, complete the following:*

- *Construct the tie-in of proposed -Y2- and existing -Y3- from -Y2- Sta. X+XX to -Y2- Sta X+XX up to but not including the final surface layer. (See TCP-X).*
  - *Place the final surface layer, Pavement Markings and Pavement Markers (See PM-X) on -Y2-, Sta X+XX to Sta X+XX, and -Y3-, Sta X+XX to Sta X+XX.*
  - *Activate the final traffic signal (Signal # XXXXX - See Signal Plans) at the -Y2- / -Y3- intersection.*
  - *Open traffic to the final pattern.*
- (2) Include a written description of how traffic will be maintained during each phase or step of construction. Refer to the proper Roadway Standard Drawing, to describe how traffic will be maintained during construction.
- (3) Refer to the Traffic Control Detail(s) by Sheet Number.
- (4) Step out traffic shifts.
- (5) Describe installation of temporary and final signal(s) and signing.
- (6) Refer to the applicable Pavement Marking Detail(s) by Sheet Number.
- (7) If the RFP allows, identify any Intermediate Contract Times (ICT's) that will be used.
- (8) Label all information on the Details that has been referred to in the Phasing. (i.e. Station numbers, road names, equalities, etc.)

c. Final Pavement Marking Plans Development requirements:

Prepare Final Pavement Marking Plans at a scale of 1"=50' (metric 1:500) unless otherwise agreed upon. The plans shall show lane widths, transition tapers, lane lines, edge lines, gore markings, symbols, word messages, and other appropriate markings and markers. See RFP for required type of markings and markers.

5. Revisions to Existing Plans

If changes to the RFC Traffic Control plan are required, a revised plan and/or sheets shall be submitted for review before issuing RFC plans for the revision. Follow the Phase Submittal requirements in the Submittal Guidelines when submitting the revision for review.